

however, by means of the bile method—which was originally introduced by Koch, and appears to induce only a temporary though “active” immunity against the disease—but by means of the use of a “serum.”

Drs. Turner and Kollé have, as already reported in these columns, found that it is possible to treat rinderpest successfully with a serum taken from animals which have already suffered from the disease produced either artificially or naturally and reinforced artificially. As a result of their investigations they are now in a position, with the aid of this serum, to control the course of the disease when artificially produced. As animals which have suffered from the disease are immune for a very considerable period, and as an animal that passes through an attack controlled by the serum is protected or “salted,” as it is termed, this method has been adopted very extensively for the purpose of protecting animals in affected and suspected districts, and it is probable that in time it will oust the bile method completely; especially as it seems to be attended by fewer disadvantages than accompany the latter method, and can be carried out at less cost and with less loss of life amongst the cattle.

In working with the serum method in rinderpest it is necessary to know as much about the serum used as it is in the case of the treatment of diphtheria with anti-diphtheric serum; but one would imagine that at the Cape, where such enormous financial interests are concerned, there should be no difficulty in obtaining pure serum, the value of which has been carefully estimated, for the treatment of cattle suffering from the earlier symptoms of rinderpest. The relative cost would be slight even were it necessary to have a series of stations from which serum might be obtained, and taking into consideration the fact that this serum might have to be thrown away periodically; and one can scarcely imagine that a method which is described as being nearly perfect, should be allowed to remain unused because there is some slight difficulty as regards the supply of money and laboratory accommodation. In connection with this part of the question, it may be mentioned that it has been proved by experiment that the serum remains quite active for at least seven months. How much longer, still remains to be proved.

It will be remembered that on a former occasion it was pointed out that “it is useless to attempt to infect whole herds which have been previously inoculated with bile, because it does not seem possible to give all such inoculated animals the disease simultaneously. Most of the cattle will become sick after injection of virulent blood, but many may remain unaffected, as the immunity conferred by the bile is still effective and protects them, and they will in consequence not become salted. In these herds the most satisfactory course to pursue is for the owner to obtain a sufficient supply of serum, and inject the cattle as soon as they are observed to be sick, or the thermometer indicates a rise of temperature. Cattle already sick require a larger dose of serum than those that are healthy, and in severe cases a second may be necessary.” This, however, as pointed out by the Veterinary Surgeon, is only an indication that the serum must be injected at a still earlier stage than has hitherto been done, so that it is necessary to apply the serum treatment to a herd of cattle which has previously been inoculated with bile soon after the injection of the virulent blood. Cattle that would have reacted to the blood take the disease in a modified form, and become salted; whilst those that would not react are no worse off for the addition of the serum, and probably have a slight addition to their passive immunity. The principal Veterinary Surgeon points out that “the fact that the immunity conferred by bile is now wearing off, makes it necessary for the farmers to take prompt action when the disease appears in their herds, and the fact that the bile immunity has ceased, gives greater

prospects of success attending the application of the serum as above indicated.” He also points out that infection is not nearly so frequently carried from artificially infected herds as from those which take the disease naturally.

Bearing on this question, there is an interesting article in the August number of the *Agricultural Journal and Mining Record*, published in Natal. The injection of bile, unless very carefully selected and preserved, appears in many cases to have set up chronic abscesses, from the description of which one would have said that they were actinomycotic or discomycotic in character, though this is a question which appears to deserve further investigation. From the annual report of the Commissioner of Agriculture for the year 1897, which appears in the same journal, it is evident that the farmers are now thoroughly alive to the importance of using bile where serum cannot be obtained, but of having recourse to serum inoculation along with the injection of blood from diseased animals, when this method can be properly carried out. The only real drawback, and this is a very slight one indeed, appears to be that in a few cases the injected blood appears to set up some form of “red water,” whilst in a few instances a malarial parasite may be transmitted along with the blood.

An idea of the expenditure on rinderpest for the year 1897 may be gathered from the fact that the outlay for fences, &c., was nearly 170,000*l.* A very small proportion of this, added to the laboratory and veterinary outlay, would enable the department to cope with this disease in future, and to save the Colony an enormous sum, both directly and indirectly. Mr. Watkins Pitchford, in his report, states that where the departmental instructions for the use of the serum have been adhered to, good “and often brilliant results have repeatedly been achieved,” and that he is right in his conjecture is very evident from the fact that when the serum is given in definite quantity on one side and rinderpest blood on the other, but simultaneously, a reaction is invariably set up in an unsalted animal; and even when this reaction is not very severe, the nature of the disease is so well defined and the results so successful that the animal is perfectly salted for some time against natural infection, and frequently against the injection of rinderpest blood: the severest test to which the method can be put. He believes thoroughly in the permanent immunisation of the herds as a means of stamping out rinderpest; but immunisation with bile, he believes, would fail, although it may be useful as a temporary measure where serum cannot be obtained. It must be remembered, however, that the immunisation of the first animal must as a rule be through the use of bile. He is strongly in favour of maintaining a trustworthy supply of serum for the cases as they may appear, and for the immunisation of any stock in herds which have already passed through the disease, but in which the immunity is still not quite sufficient. Those who are most intimately acquainted with the history of rinderpest, and of the recent work on serum-therapy in connection with this disease, are now satisfied that the extinction of rinderpest amongst Cape cattle is already practically accomplished.

NOTES.

ON Friday last, November 11, the Chemical Society gave a banquet in honour of six of its Past-Presidents who had been for over half a century Fellows of the Society. The occasion was the more noteworthy that these eminent chemists—Gilbert, Frankland, Odling, Abel, Williamson, and Gladstone—are in many cases ranked among those whose teaching has most deeply influenced chemical science. As M. Friedel said: “They form the finest phalanx of the fathers of chemistry

which exists in any country." The season of the year prevented many foreign chemists from attending, but a great number of letters and telegrams were received. Amongst the men of science present were Prof. Armstrong, Sir J. Wolfe Barry, Sir G. Birdwood, Sir J. Crichton Browne, Dr. Böttinger, Major-General Sir Owen Tudor Burne, Dr. T. Lauder Brunton, the Vice-Chancellor of Cambridge University, Sir Ernest Clarke, Sir W. Crookes, Major-General Sir J. Donnelly, Prof. Wyndham Dunstan, Dr. Dupré, Dr. Dyer, Mr. T. H. Elliott, Mr. H. M. Elder, Sir John Evans, Major-General Festing, Prof. Michael Foster, Prof. P. Frankland, Sir Archibald Geikie, Mr. W. Gowland, Mr. C. E. Groves, Mr. W. Hills, Sir W. Huggins, Prof. Judd, Dr. W. Kellner, Lord Lister, Major P. A. MacMahon, the President of Magdalen, Prof. Herbert McLeod, Prof. Raphael Meldola, Dr. Rudolph Messel, Prof. H. A. Miers, Prof. G. M. Minchin, Dr. Ludwig Mond, Mr. J. Fletcher Moulton, Q.C., M.P., Dr. Hugo Müller, Sir A. Noble, Prof. W. Ostwald, Dr. W. H. Perkin and Prof. W. H. Perkin, the Master of Peterhouse, Dr. Pye-Smith, Mr. Boverton Redwood, Prof. Ramsay, Lord Rayleigh, Lord Reay, Prof. Roberts-Austen, Prof. Rücker, Dr. Russell, Prof. Smithells, Prof. Sprengel, Sir G. Gabriel Stokes, Mr. J. W. Swan, Prof. J. M. Thomson, Dr. Thorpe, Prof. Tilden, Mr. Tyrer, and Sir H. Trueman Wood. We hope to give in another issue a full report of the speeches made on the occasion of this highly successful gathering.

At the opening meeting of the new session of the Royal Geographical Society on Monday, the President, Sir Clements Markham, referred to the exploration of the Antarctic regions as the most important geographical work of our time. He remarked that the Antarctic agitation had spread over Europe, and was no longer confined to Great Britain. The Germans would certainly despatch an Antarctic expedition in 1900. Dr. Neumayer, the great authority on terrestrial magnetism, had been working with this end in view for years. A steam-vessel, specially designed and equipped for Antarctic service, would be built at Bremerhaven. The German Government would help with funds and in other ways, and would lend officers, even although they might have to go some distance from the end of a telegraph wire. Dr. Erich von Drygalski, the distinguished Greenland explorer, would lead the scientific staff. Dr. Neumayer looked to us for co-operation. They would understand now why they could not wait for Admiralty changes of policy. It ought to be a Government expedition under naval discipline. But if our navy was to be deprived of her right, the next best thing must be done; they must appeal to the country. The Council of the Society had resolved to head the list of subscriptions, even if its name should stand alone. There were numerous calls upon their funds, but they had resolved to strain them to the uttermost for that great national work. The Council would head the list with the sum of 5000*l*.

PROF. MICHAEL FOSTER and Prof. Rücker, Secretaries of the Royal Society, were present at the opening meeting of the Royal Geographical Society, and expressed the sympathy of the Royal Society in the movement for Antarctic exploration referred to by the President. Prof. Foster remarked that the Government granted the sum of 4000*l*. a year for the cultivation of all branches of science, and it had been determined to make an application to the Committee which administered that 4000*l*. for a sum which should indicate how that Committee, representing not only the Royal Society, but all the scientific societies of this country, held in scientific esteem the proposed expedition. It was not so much the sum of money that would be obtained as a clear indication that that Antarctic expedition was

an expedition of undoubted and great scientific value. He did trust, speaking on behalf of the Society, that the appeal which had been made by the President of the Royal Geographical Society might be responded to liberally. Prof. Rücker said he did not think too much stress could be laid on the fact that any connection with Germany was in this case of the very greatest importance; that observations which were taken simultaneously in different parts of the Antarctic regions would be worth far more than two sets of observations taken several years apart. It was a matter of the greatest importance that the two expeditions should go out at the same time and co-operate with one another in the sense that their observations should be carried out with a common object. Sir Joseph Hooker, Sir Erasmus Ommanney, and Sir Leopold McClintock also spoke in favour of the proposed expedition. Admiral Sir W. Wharton thought such an expedition would be best carried out under the auspices of the Admiralty, because it would be an expedition of great difficulty and would need strict discipline. But the Government had for the time being declined to afford their aid, and he was very much of opinion that a small expedition, which, he hoped, might be sent out by private aid, would be able to act as the pioneer of a larger expedition afterwards.

THE International Congress of Mathematicians will meet in Paris on August 6-12, 1900. The Mathematical Society of France has appointed committees of organisation, M. Poincaré being president of that concerned with scientific papers, and M. Darboux of that concerned with the other arrangements.

THE fiftieth anniversary of the death of Berzelius was celebrated at Stockholm, on October 7, by a memorial service, at which the King was present. In commemoration of this event a small volume, containing twenty letters exchanged between Berzelius and C. F. Schönbein in the years 1836-1847, edited by Prof. G. W. A. Kahlbaum, has been published by Benno Schwabe, Basel.

DR. CALMETTE, director of the Pasteur Institute at Lille, has been made an Officer of the Legion of Honour.

THE death is announced, at Rome, of Count Michele Stefano de Rossi, distinguished for his seismological work.

LETTERS recently received from Prof. A. C. Haddon, who it will be remembered left England in March last with an exploring party, to continue his researches in the Torres Straits, report favourable progress of the work. The islanders are said to have been everywhere delighted with the phonograph; but misfortune early befell the party, in the miscarriage of a case containing their cinematograph films and Joly's colour-photography apparatus. We regret to add that Dr. Haddon has been the victim of two or three very mild attacks of fever, and that one of his companions has been more severely affected. The latest intelligence reports an improved state of health, and that they will be by now leaving for Bornea, with the exception of Dr. Rivers and Mr. Wilkin, who are expected to return to England before Christmas.

WE regret to see the announcement of the death, at the age of sixty-five, of the French electrical engineer, M. de Meritens, under distressing circumstances. The best-known invention made by M. de Meritens (remarks the *Engineer*) is his dynamo, and though one of the very first, if not the first dynamo of any practical value, it is still used at the present time, though only—to any extent, at least—for electric lighthouses. The dynamo is an alternating-current machine, and its field consists of permanent magnets. In efficiency it may fall short of machines of

later type, but it has sterling merit, as is evidenced by the number of years it has been at work continuously, night after night, in the electrically-lit lighthouses of Great Britain, France, and other countries. The last in this country to be so fitted was that at St. Catherine's Point, in the Isle of Wight. This was in 1888. M. de Meritens' inventions did not by any means end here. In the early days of storage batteries he was to the front with an invention by which he sought to increase the surface of the plates immersed in the liquid by means of a plate of lead, so bent that pockets were formed in it, in which lead shot were placed. He also suggested many other forms of battery. M. de Meritens also invented a motor, and at one time turned his attention to electric welding, being the first to suggest using carbon for one pole and the metal to be welded for the other pole. He also attempted to improve on the original "candle" of Jablochhoff by utilising a third rod of carbon between the two outside rods, instead of the usual plaster of Paris or kaolin.

THE annual meeting of the Yorkshire Naturalists' Union has been postponed from Saturday, November 19, to December 17.

THE officers of the Botanical Society of America for the ensuing year are as follows:—President, Prof. L. M. Underwood; vice-president, Prof. B. L. Robinson; secretary, Prof. G. F. Atkinson.

DR. G. KLEBS has been appointed professor of botany and director of the Botanic Garden at Halle, and Dr. W. Schimper succeeds Klebs as professor of botany at the University of Basel. M. C. Sauvageau has been appointed professor of botany to the Faculty of Sciences at Dijon.

WE learn from the *American Naturalist* that the University of California has received from the Alaskan Commercial Company of San Francisco a large and valuable gift, consisting of the collections which the company has been accumulating for many years. The ethnological portion of the collection is especially rich, and is probably one of the best in existence. The collection also includes fossil remains of mammoth, and many skins and mounted specimens of mammals, birds, and invertebrates of the Alaskan region.

THE State of Hamburg has, according to the *Botanical Gazette*, just established, at Freihafen, a station for plant protection under the direction of Dr. C. Brick. The station will look after the introduction of injurious insects with the shipments of living plants from abroad, and its duties will include also the combating of plant diseases, the oversight of the schools of viticulture, and the inspection of vineyards and orchards in the Hamburg region, together with such questions as may arise in the prosecution of the work.

THE winter lecture season at the Imperial Institute opened on Monday with an illustrated lecture on "Trinidad, with some account of the recent hurricane in the West Indies," by Mr. Henry Caracciolo. The lectures are open to the public without payment, seats being reserved for Fellows of the Imperial Institute and their friends. The following are among the subjects of lectures before Christmas:—"The stalactite caves of New South Wales," by Mr. F. Lambert; "Gold-mining in Victoria," by Mr. E. Lidgley; "A national photographic record," by Sir J. Benjamin Stone, M.P.

A FEW particulars of Mr. Nikola Tesla's new method of electric power transmission are given in the current number of the *Electrical Review*. From the article it appears that the invention consists in transmitting electrical power without the employment of metallic line conductors, by taking advantage of the conductivity of the rarefied air existing in the upper regions

of the earth's atmosphere. In order to make this practicable, special apparatus has been devised for the production and conversion of excessively high electrical pressure. Heretofore, it has been possible, by means of the apparatus at command, to produce only moderate electrical pressures, and even these, with considerable risks and difficulties. Mr. Tesla, however, claims that he has devised means whereby he is enabled to generate, with safety and ease, electrical pressures measured by hundreds of thousands, and even by millions of volts. He has also, during his investigations with such apparatus, discovered certain highly important and useful facts, which are said to render practicable his new system of transmitting electrical energy. Among these are the following: first, that with electrical pressures of the magnitude and character which he has been able to produce, the ordinary atmosphere becomes, in a measure, capable of serving as a true conductor for the transmission of the current; second, that the conductivity of the air increases so materially with the increase of electrical pressure and the degree of exhaustion, that it becomes possible to transmit, through even moderately rarefied strata of the atmosphere, electrical energy up to practically any amount and to any distance.

DR. C. LE NEVE FOSTER's general report (Part iii.) and statistics relating to the output and value of the minerals raised in the United Kingdom, the amount and value of the metals produced, and the exports and imports of minerals, in 1897, has been published as a Blue Book. The following interesting facts are recorded in it. The output of coal last year was 202,129,931 tons, the highest hitherto recorded. The quantity of coal imported was no less than 37 million tons, and is likewise the highest on record. The output of iron ore reached 13 $\frac{3}{4}$ million tons last year. Aluminium and sodium appear in the report for the first time. It is pointed out that the production of alumina from alum clay or bauxite, and the extraction of the metal in the electric furnace, form a new branch of industry which was only started in the United Kingdom by the British Aluminium Company a short time ago. The alumina is prepared at works near Larne, County Antrim, and then despatched to Foyers in Inverness, where abundant water-power enables electricity to be generated cheaply. The Foyers installation is so far the largest water-power plant in the United Kingdom. The quantity of alumina extracted at the Larne works last year was 850 tons, value 15,300*l.*, which produced 310 tons of aluminium, value 45,880*l.* With regard to sodium, the Aluminium Company, of Oldbury, near Birmingham, are practically the only makers of this metal in the United Kingdom. The quantity made last year was about 85 tons. At the present market price this output would be worth 12,750*l.* It is regretted that statistics concerning the quantities of magnesium and potassium are unobtainable.

THE total output of gold ore (auriferous quartz) in the United Kingdom in 1897 is given by Dr. Foster, in the report above referred to, as 4517 tons, the total value at the mines being 6282*l.* Turning to the ores of copper, lead, tin and zinc, Dr. Foster's tables do not present a satisfactory picture. Copper mining is a decaying industry. The output of lead ore is also declining; last year it was only 35,338 tons, being the smallest recorded during the last half-century. We only now produce one-half the amount of lead ore we did twenty-five years ago, and the same remark applies in the case of tin ore, while the values in both cases have decreased to one-fourth. The output of zinc ore, 19,278 tons, almost the same as it was in 1896, does not reach the average of the last quarter of a century. Of the so-called non-metallic minerals, clay, limestone, sandstone and slate are the most important, the value of the output in each case exceeding one million sterling. A new feature in the volume consists of

county summaries, showing by means of tables the output of each county. This will prove of great service to those who are specially interested in the welfare of any particular county.

FROM Prof. Kr. Birkeland we have received a reprint of a paper by him in the *Archives des Sciences physiques et naturelles*, on the phenomena of attraction or "suction" of cathodic rays by a magnetic pole. Since the author's previous paper in 1896, the subject has been treated from a theoretical standpoint by Poincaré, whose views have been put to an experimental test in a recently published paper by Wiedemann and Wehnelt. In the meantime Prof. Birkeland has made a new series of experiments on the subject, and his present paper not only affords a completion of Wiedemann and Wehnelt's investigation, but furnishes a simple method for determining the relation existing between the velocity of the cathodic rays and the difference of potential (between anode and cathode) under which these rays are emitted.

MR. B. G. TEUBNER, of Leipzig, has commenced to bring out a new and important mathematical work in German, entitled the "Encyclopaedia of the Mathematical Sciences." The object of the Encyclopaedia is to give in a concise form but with the greatest possible completeness, and in a manner adapted for easy reference, all the newest results in both pure and applied mathematics. It is also proposed to show by carefully-prepared literary sketches, the historical development of mathematical methods since the beginning of the century. The Encyclopaedia will consist of six volumes, of about 3840 pages, of which the first will treat of Arithmetic and Algebra; the second, of Analysis; the third, of Geometry; the fourth and fifth, of Applied Mathematics; and the sixth, volume of historical and allied matter. In the detailed table of contents the absence of any reference (specific or indirect) to "Trigonometry" or "Circular Functions" is somewhat remarkable, seeing that even such a subsidiary subject as "Inversion" has a whole section devoted to it under Geometry. The editors are Dr. H. Burkhardt (Zürich) and Dr. W. Franz Meyer (Königsberg), and the work is being published under the auspices of the Imperial and Royal Academies of Munich and Vienna and the Royal Society of Göttingen. From the prospectus we learn that "lengthy demonstrations will in general be omitted."

THE French Meteorological Office has recently issued its *Annales* for 1896, comprising three large quarto volumes. The first volume, under the title of "Memoirs," contains a discussion by M. Fron of thunderstorms observed during the year, with charts showing their distribution for each day on which a storm occurred. M. Moureau publishes the details of the magnetic observations at Parc St. Maur, with a summary of the characteristics of the principal disturbances. These and the simultaneous variations of earth currents are also shown by means of curves. There is an important work by M. Brillouin on contiguous winds and clouds, in which the author studies the very complicated phenomena that may be produced in a region where two atmospheric strata mix together, and in which the amount of cloud is unequal. M. Angot discusses the problem of the barometric measurement of heights, and has prepared new tables to facilitate the calculations. The attention of scientific men has been drawn to this question by the observations made during recent international balloon ascents. A contribution to the rainfall of the region of the Upper Nile is made by M. de Martonne. Monthly and yearly values are given for some forty stations, collected from various sources. There are also other papers of a minor character. Vol. ii. contains the results of observations made at various stations. The colonial stations have been considerably extended, especially in Africa, and some observations are given for Timbuctoo, in the centre of that con-

tinent. Vol. iii. is devoted entirely to the discussion of rainfall observations; the number of stations included in the work exceeds two thousand.

IN connection with the journal *Photography*, silver and bronze medals are offered for the best sets of lantern slides relating to the subjects named in the following sections:—(1) The rivers of Great Britain; (2) the commercial ports of Great Britain; (3) the old churches of the United Kingdom; (4) British trees, plants, and flowers; (5) scenes among fishermen; (6) striking natural scenes in Great Britain (rocks, caves, trees, waterfalls, &c.). The competing slides should be in the hands of the editors by December 10. The object of the competition is to renew sets of similar slides which have for several years been circulated by *Photography*, without charge or fee, and have been largely used in schools for purposes of instruction.

Two papers on the food of certain cuckoos and shrikes, based on investigations by Prof. F. E. L. Beal and Dr. S. D. Judd, are contained in *Bulletin* No. 9 of the Division of Biological Survey (U.S. Department of Agriculture). In the laboratory of the Biological Survey 109 stomachs of the yellow-billed cuckoo (*Coccyzus americanus*), and forty-six of the black-billed cuckoo (*C. erythrophthalmus*), taken between May and October, were examined. The results show that of the 155 stomachs of both species only one contained any vegetable food. It appears that the insect food of these birds consists of beetles, grasshoppers, cicadas, bugs, ants, wasps, flies, caterpillars, and spiders, of which grasshoppers and caterpillars constitute more than three-fourths. The great majority of the insects found in the stomachs were harmful kinds. It is a matter of common observation that cuckoos feed largely on caterpillars, and stomach investigations not only confirm this, but show that, unlike most other birds, they eat freely of hairy and bristly species. Nearly half of the food of the birds examined was found to be caterpillars. Considering the number of grasshoppers, locusts, and other insects that cuckoos eat, in addition to caterpillars, it is evident that from an economic point of view these birds are two most valuable species, and as they have not been convicted of doing any harm, they should be protected and encouraged in every possible way. Besides insects proper, Prof. Beal found a number of spiders in the stomachs he examined, most of them the long-legged kinds commonly known as "daddy longlegs" (*Phalangidae*). One stomach contained seven, the mass of tangled legs looking like a bunch of coarse hair. When we consider the disagreeable odour of these spiders, their long legs, and the fact that their bodies have the texture of sandpaper, we are again forcibly reminded that tastes differ. But the most remarkable thing which the birds examined had eaten was a small tree frog (*Hyla*), which had been swallowed whole!

DR. S. D. JUDD investigated the food of two species of shrikes, and the results are given in the *Bulletin* referred to in the foregoing note. One species, the loggerhead shrike (*Lanius ludovicianus et sub-spec.*) is a permanent resident of the United States; the other, the butcherbird (*Lanius borealis*), is a migrant from the north. From the investigation it appears that the food of the butcherbird and loggerhead, as shown by 155 stomachs collected during every month in the year, and in an area extending from California to the Atlantic coast, and from Saskatchewan to Florida, consists of invertebrates (mainly grasshoppers), birds, and mice. During the colder half of the year the butcherbird eats birds and mice to the extent of 60 per cent., and ekes out the rest of its food with insects. In the loggerhead's food, birds and mice amount to only 24 per cent. A table showing percentages of principal elements of food of the butcherbird and loggerhead indicates that the loggerhead's beneficial qualities

outweigh 4 to 1 its injurious ones. Instead of being persecuted the bird should, therefore, receive protection.

CORNWALL is to be congratulated upon the success of the efforts its Technical Instruction Committee are making for the benefit of fishermen, through Mr. J. T. Cunningham, the County lecturer on fishery subjects. The report of the executive committee for fisheries for the year 1897-98, is almost entirely devoted to a valuable statement by Mr. Cunningham on records of sea fishing and sea temperature, experiments on oyster culture and lobster rearing, fish and net curing, and other matters concerning the science and handicraft of sea fisheries. Among the interesting items referred to in his report, is the fact that at the beginning of every season male crabs are always more numerous in the pots than females. Their number increases gradually till May or June, when it gradually diminishes; while the number of females taken does not reach its maximum till June or July, and then they are twice as numerous as the males, and they usually continue to be more abundant than the males until the end of the season. On the other hand, practically the same number of male lobsters are caught as female. The observations of surface temperature, made in connection with these fisheries, are of great service in indicating the influence of temperature upon the number of fish taken in various months. With regard to lobster rearing, Mr. Cunningham reports that important and gratifying success has been obtained, and much precise knowledge has been gained concerning the particular details of treatment on which the life and death of the larvae depend. His observations have convinced him that the opinion that swimming lobster larvae in the sea capture and feed upon other swimming creatures, especially other small swimming crustaceans, is wrong. He holds that lobster larvae are, like the adults, carrion feeders, and are not in the habit of pursuing or capturing live food at all.

MESSRS. DUCKWORTH announce for publication "A Glossary of Botanical Terms," by Mr. B. Daydon Jackson; and a "Text-book of Agricultural Botany," by Mr. J. Percival.

MESSRS. J. M. DENT AND CO. announce that after the December number *Natural Science* will be published by Mr. Young J. Pentland, of Edinburgh, who has acquired all future rights.

MESSRS. W. WESLEY AND SON have just issued a new Catalogue (No. 132 of their Natural History and Scientific Book Circular), giving a descriptive and classified list of 1500 books and pamphlets on the natural history of Great Britain and Ireland. The arrangement of works under the names of the English counties, Wales, Scotland and Ireland, will be of service to collectors of local fauna and flora.

THE following new editions of works already reviewed in NATURE have been received:—The third edition of Prof. Grenville Cole's "Aids in Practical Geology" (London: Charles Griffin and Co.) The work has been completely revised and enlarged; many additions of practical service to the geologist have been made, and all important factors of geological progress since 1893, when the second edition appeared, have been taken into consideration.—Messrs. Slingo and Brookes's well-known volume on "Electrical Engineering for Electric Light Artisans and Students" has been published in a revised and enlarged edition by Messrs. Longmans, Green, and Co. The work now occupies 780 pages, and it provides students with sound information concerning direct and simple alternating currents, the machinery and apparatus connected therewith, and their most important applications.—The tenth edition of Mr. C. Haughton Gill's "Chemistry for Schools" (Edward Stanford) has been published. Dr. D. Hamilton Jackson is responsible for the

revision of the book and the additions made to bring it into line with the new regulations in chemistry for the London University Matriculation Examination.—The second edition, revised and enlarged, of Dr. Lassar-Cohn's "Chemistry in Daily Life," translated by Mr. M. M. Pattison Muir, has been published by Messrs. H. Grevel and Co.

THE additions to the Zoological Society's Gardens during the past week include two Pumas (*Felis concolor*, ♂ ♀) from the Argentine Republic, presented by Mr. Ernest Gibson; a Hamster (*Cricetus frumentarius*), European, two Bennett's Wallabies (*Macropus bennetti*) from Tasmania, a Gentoo Penguin (*Pygosceles taeniatus*) from the Falkland Islands, a Gold Pheasant (*Thaumalea picta*, ♀) from China, two Elephantine Tortoises (*Testudo elephantina*) from the Aldabra Islands, deposited; two Japanese Deer (*Cervus sika*, ♂ ♂) from Japan, received in exchange; an Axis Deer (*Cervus axis*, ♀), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

THE LEONIDS.—Unfortunately for observers in the neighbourhood of London, a fog more or less continuously hung over their heads on the nights of Sunday, Monday and Tuesday, and rendered observations of the expected meteor shower impossible. Observers at the Solar Physics Observatory, South Kensington, were only able to observe two or three meteors during these nights. One of special brilliance, on the night of Monday, at 10.48 G.M.T., shot across the sky from east to west, its path extending at least 45 degrees. This was undoubtedly a fine Leonid; but its path could not be traced, as fog and cloud hid the stars from view.

Mr. R. H. Scott informs us that the meteorological reporter at Jersey (Mr. Fisher, at St. Aubin's) has reported to the Meteorological Office that a meteor shower was observed there at 10 p.m. on Monday.

From a New York telegram, published in one of the daily papers, we gather that the shower was observed in America on the night of the 14th, but it did not attain the expected brilliancy. Prof. Young is said to describe the shower observed as faint, while at the Lick Observatory the meteors were said to be small and not marked by extraordinary brilliancy.

A GLOBE FOR METEOR OBSERVERS.—Every observer, who has plotted the trails of meteors on star charts, knows that errors of projection arise which are due to the difficulty of plotting accurately the whole length of the trail. If the points of beginning and end of the visible trail be mentally noted and marked off on a star chart, then the line joining these two points does not represent the actual trail of the meteor, in consequence of the fact that the path in the heavens is on a sphere, and that on the chart is on a plane. To avoid such discrepancies it is always better to use a celestial globe, when this difficulty is eliminated. The ordinary celestial globe is, however, not well adapted for recording meteor observations, as it must be illuminated from the outside by a lamp, as the observer is in the open air.

A globe arranged especially for use when such observations are being made, recently invented by M. Pietro Maffi, is described in the French journal *Cosmos*, and should be found very serviceable. It consists of a glass hollow sphere mounted on two vertical supports, and capable of adjustment as regards latitude. The outer surface is marked with the brighter stars of each constellation and the Milky Way, and there is also means of obtaining directly the right ascension and declination of any point on the globe. The inside contains two small electric lamps in connection with accumulators in the stand, so that the whole surface of the sphere with the constellations may be seen clearly. Directly a meteor is seen its path can be plotted, and when note is taken of its exact position a wet sponge is all that is necessary to erase it.

The globe and stand, as it appears in the illustration accompanying the article, seems rather elaborate; but there is apparently no reason why a more simple and cheaper form should not be made, for its use then would be more widely distributed.